

42-079-00014
RECEIVED

NOV 10 2008

COMMONWEALTH OF PENNSYLVANIA

Department of Environmental Protection

7/23/2008

717-787-9483

ENFORCEMENT ASSOCIATE DIR. (34P00)

SUBJECT: Source Test Review

UGI Development Company (formerly Hunlock Creek Energy Ventures)
Hunlock Creek Power Station
Hunlock Township, Luzerne County
Boiler Unit No. 6, Source ID 031
Title V Permit No. 40-00005
eFacts ID No. 1671628

TO: Brian Halchak
Facilities Section
Northeast Regional Office (NERO)

FROM: Darren Lauer, Air Quality Specialist *D.L.*
Source Testing Section
Division of Source Testing and Monitoring

THROUGH: Gregory D. Parrish, Chief *GP*
Division of Source Testing and Monitoring
Bureau of Air Quality

Rick Begley, Chief *KB*
Source Testing Section
Division of Source Testing and Monitoring

UGI Development Corp., operates a Foster Wheeler boiler identified as Boiler No. 6, at its Hunlock Creek Facility. The boiler has a rated at heat input capacity of 636.5 MMBtu/hr and is used to produce steam to power a 50 megawatt (MW) electric generator. Emissions from the boiler are controlled by two Research Cottrell, Inc. electrostatic precipitators (ESP), designated as ESP unit 1 & ESP unit 2, before the effluent is discharged to the atmosphere via a 120-inch diameter exhaust stack.

On October 3 & 4 of 2007, Avogadro Environmental Corporation (Avogadro) performed testing to evaluate the performance of the ECOBIK™ combustion air treatment system to demonstrate compliance with the NERO request for determination (RFD) and Title V Permit. Testing was performed to determine multiple metals (EPA Method 29) and hexavalent chromium (Cr⁺⁶, Method SW846-0061) emissions for the boiler. In addition, EPA Method 19 (M19) was used to calculate the Fc Factor for each test date from the ultimate analysis data. Carbon dioxide measurements were conducted using the certified CO₂ CEMS equipment

installed near the stack sampling location. This data and the calculated Fc Factor were used to determine lbs/MMBtu. Heat input data to document boiler operating levels during testing were determined using the certified CEMS CO₂, volumetric flow data, and the Fc value and was output by the CEMS data acquisition system (CEM DAS). Pulverized coal was fired during testing. The boiler combustion air was treated with the ECOBIK™ system by injecting a 3 % fluidized solution containing heavy metal oxides into its burner chambers. The ECOBIK™ system is purported by the manufacturer to increase burner efficiency, help reduce boiler interior slagging, and reduce pollutant emissions. The EPA Method 29 audit samples were analyzed and the results met the acceptance criteria.

All test results are acceptable to the Department as representative of the emissions under the operating conditions during testing and may be used for compliance determinations.

The following is a summary of data presented in the test report:

Operating Data During Multiple Metals Testing:

Test Dates:	10/03/07	10/03/07	10/03/07	
Run Number	1	2	3	Avg.
Heat Input (MMBtu/hr) ¹	529.9	523.1	519.0	524.0
Rated Heat Input (MMBtu/hr)	636.5			
% of Rated Heat Input ¹	83.3	82.2	81.5	82.3
Steam Production Rate (Kilo lbs/hr [Klb/hr]) ¹	426.4	431.6	426.4	428.1
Load (Gross MW) ¹	45.6	46.3	45.5	45.8

Multiple Metals Test Results:

Test Dates:	10/03/07	10/03/07	10/03/07	
Run Number	1	2	3	Avg.
Volumetric Flow Rate (dscfm)	147,293	145,648	152,360	148,433
Carbon Dioxide (%)	13.4	13.6	13.4	13.4
Isokinetic (%)	108.2	105.0	105.1	106.1
Fc (dscf/MMBtu)	1,829			
Arsenic Concentration (µg/dscm)	42.0	60.0	49.0	50.0
Arsenic Mass Emissions Rate (lbs/hr)	2.3E-02	3.3E-02	2.8E-02	2.8E-02
Arsenic Emissions Rate (lbs/ MMBtu)	3.6E-02	5.1E-05	4.2E-05	4.3E-05
Beryllium Concentration (µg/dscm)	0.41	0.39	0.37	0.39
Beryllium Mass Emissions Rate (lbs/hr)	2.2E-04	2.1E-04	2.1E-04	2.2E-04
Beryllium Emissions Rate (lbs/ MMBtu)	3.5E-07	3.3E-07	3.2E-07	3.3E-07
Cadmium Concentration (µg/dscm)	0.34 ²	0.35 ²	1.6	0.76
Cadmium Mass Emissions Rate (lbs/hr)	1.9E-04 ²	1.9E-04 ²	9.0E-04	4.3E-04
Cadmium Emissions Rate (lbs/ MMBtu)	3.0E-07 ²	3.0E-07 ²	1.3E-06	6.3E-07
Chromium Concentration (µg/dscm)	22.0	18.0	17.0	19.0
Chromium Mass Emissions Rate (lbs/hr)	1.2E-02	9.7E-03	1.0E-02	1.1E-02
Chromium Emissions Rate (lbs/MMBtu)	1.9E-05	1.5E-05	1.5E-05	1.6E-05
Copper Concentration (µg/dscm)	12.0	9.9	13.0	11.0
Copper Emissions Rate (lbs/hr)	6.4E-03	5.4E-03	7.2E-03	6.4E-03
Copper Emissions Rate (lbs/ MMBtu)	9.9E-06	8.3E-06	1.1E-05	9.7E-06
Lead Concentration (µg/dscm)	7.6	7.5	9.2	8.1
Lead Mass Emissions Rate (lbs/hr)	4.2E-03	4.1E-03	5.3E-03	4.5E-03
Lead Emissions Rate (lbs/MMBtu)	6.5E-06	6.3E-06	7.9E-06	6.9E-06
Manganese Concentration (µg/dscm)	30.0	17.0	16.0	21.0
Manganese Mass Emissions Rate (lbs/hr)	1.7E-02	9.1E-03	9.1E-03	1.2E-02
Manganese Emissions Rate (lbs/MMBtu)	2.6E-05	1.4E-05	1.4E-05	1.8E-05
Mercury Concentration (µg/dscm)	35.0	34.0	29.0	33.0
Mercury Mass Emissions Rate (lbs/hr)	0.019	0.019	0.017	0.018
Mercury Emissions Rate (lbs/MMBtu)	3.0E-05	2.9E-05	2.5E-05	2.8E-05
Nickel Concentration (µg/dscm)	9.3	6.9	8.0	8.1
Nickel Mass Emissions Rate (lbs/hr)	5.1E-03	3.7E-03	4.6E-03	4.5E-03
Nickel Emissions Rate (lbs/MMBtu)	7.9E-06	5.8E-06	6.9E-06	6.9E-06
Selenium Concentration (µg/dscm)	360.0	280.0	310.0	320.0
Selenium Mass Emissions Rate (lbs/hr)	0.20	0.15	0.17	0.18
Selenium Emissions Rate (lbs/MMBtu)	3.0E-04	2.4E-04	2.6E-04	2.7E-04
Vanadium Concentration (µg/dscm)	13.0	12.0	13.0	13.0
Vanadium Mass Emissions Rate (lbs/hr)	7.2E-03	6.4E-03	7.3E-03	7.0E-03
Vanadium Emissions Rate (lbs/MMBtu)	1.1E-05	9.9E-06	1.1E-05	1.1E-05
Zinc Concentration (µg/dscm)	57.0	61.0	53.0	57.0
Zinc Mass Emissions Rate (lbs/hr)	3.2E-02	3.3E-02	3.0E-02	3.2E-02
Zinc Emissions Rate (lbs/MMBtu)	4.9E-05	5.1E-05	4.5E-05	4.9E-05

Operating Data During Hexavalent Chromium (Cr⁺⁶) Testing:

Test Dates:	10/04/07	10/04/07	10/04/07	
Run Number	1	2	3	Avg.
Heat Input (MMBtu/hr) ¹	524.8	509.3	507.4	513.8
Rated Heat Input (MMBtu/hr)	636.5			
% of Rated Heat Input ¹	82.5	80.0	79.7	80.7
Steam Production Rate (Kilo lbs/hr [Klb/hr]) ¹	435.9	436.0	430.1	434.0
Load (Gross MW) ¹	46.3	46.3	45.8	46.1

Hexavalent Chromium (Cr⁺⁶) Test Results:

Test Dates:	10/04/07	10/04/07	10/04/07	
Run Number	1	2	3	Avg.
Volumetric Flow Rate (dscfm)	152,038	150,194	147,557	149,930
Carbon Dioxide (%)	12.9	13.0	13.0	13.0
Isokinetic (%)	101.3	101.4	101.3	101.3
Fc (dscf/MMBtu)	1,850			
Cr ⁺⁶ Concentration (µg/dscm)	<0.264	<0.267	<0.272	<0.268
Cr ⁺⁶ Mass Emissions Rate (lbs/hr)	<1.51E-04	<1.50E-04	<1.51E-04	<1.51E-04
Cr ⁺⁶ Emissions Rate (lbs/MMBtu)	<2.36E-07	<2.38E-07	<2.42E-07	<2.39E-07

¹ reviewer calculated averages based upon the reported raw process data

² corrected values are shown based upon use of the analytical detection limit (ADL) of 1.0 µg since the results were below the ADL.

Cc: Stack Test File (RED) – UGI Development Company (formerly Hunlock Creek Energy Ventures), Hunlock Creek Power Station, Hunlock Township, Luzerne County, with attachments

Mark Wejksznar, Northeast Regional Office

AIMS/AKB

EPA/AKB

Reading File, Source Testing Section

Ec: V. Trivedi, Division of Permits